

2 SRI-CAT BEAMLINES, TECHNICAL DEVELOPMENTS, AND SCIENTIFIC APPLICATIONS

2.1 Mission of SRI CAT

The SRI CAT is composed of members from XFD and UPD, as well as non-APS researchers. These outside members are divided into two categories, Developers, who provide financial support, and Scientific Members, who bring intellectual capital to the CAT. A current list of SRI-CAT members can be found in Appendix 3.

The stated mission of the SRI CAT is:

To conduct R&D activities towards the improvements of insertion devices, standard components, high-heat-load optics, and other novel x-ray optical components, and to develop innovative techniques useful to the entire community of APS CATs.

To develop and implement strategic instrumentation programs that will open up new areas of research at the APS.

To attract, educate, and foster new research communities in the uses for and applications of synchrotron radiation.

The SRI CAT continues to develop novel instrumentation that is of use to the APS community. In addition the SRI CAT still serves as a test bed for accelerator developments, such as top-off studies and lattice distortions to improve x-ray beam position monitor performance, and a variety of other technical components.

More recently, our emphasis has evolved towards the latter two points of the mission statement. In that regard, we are proud to say that our strategic instrumentation programs, namely the hard x-ray microfocusing program, inelastic scattering program and 0.5 to 3 keV program have flourished. In fact these programs have nucleated new CATs, the IXS CAT, for instance, and have served as a valuable resource for the development of the Nano-CAT. The success of the polarization program has lead us to spin off a beamline dedicated to the use and applications of polarized x-rays from 0.5 to 100 keV, and our experience gained in the area of use and applications of high-energy x-rays has prompted us to consider a beamline dedicated to this purpose.

From the beginning of our beamline operations, SRI CAT has provided beam time to other CATs for testing beamline components and to jumpstart their core science programs while their beamlines are under construction. We continue to provide this opportunity to some of the newer CATs, most recently, the high pressure (HP) CAT.

We believe we have also been successful in educating existing communities and bringing in new communities to use synchrotron radiation. Members of SRI CAT have played important roles (Scientific Co-Director and Laboratory Coordinator) in the development and running of the National School for Neutron and X-ray Scattering,

hosted by ANL the last two summers. The goal of the school is to provide training for graduate students in the utilization of national user facilities such as the APS. In addition to the organizational aspects of the school, many of the SRI CAT staff participated in the laboratory experiments that were performed on the APS beamlines. Inside Argonne, we have nurtured collaborations with the Energy Systems Division at ANL to develop novel techniques for the study of diesel fuel spray for automotive applications and the Environmental Division to look at interesting specimens, including a strand of Beethoven's hair. We routinely host researchers from the fields of biology, environmental science, and the medical sciences on our imaging and microfocusing beamlines, and, under our guidance, scientists from the Adler planetarium, The University of Chicago Oriental Institute, and the Field Museum have all participated in experiments on the SRI CAT beamlines.